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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,114	03/28/2001	Ching-Wei Chang	SLA.0390	2326

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EXAMINER

THOMPSON, JAMES A

ART UNIT PAPER NUMBER

2624

DATE MAILED: 11/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/820,114

Applicant(s)

CHANG, CHING-WEI

Examiner

James A Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

The abstract of the disclosure is objected to because the abstract is written in legal claim language. The abstract needs to be written in narrative form. Correction is required. See MPEP § 608.01(b).

**Notice Regarding Claims**

2. Applicant is advised that should claim 3 be found allowable, claim 8 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

**Claim Rejections - 35 USC § 103**

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao (US Patent 6,172,769 B1) in view of Karlsson (US Patent 5,777,757).

Claim 8 comprises all of the limitations of claims 1, 2 and 3. Therefore, claims 1, 2, 3 and 8 are discussed together.

**Regarding claims 1, 2, 3 and 8:** Rao discloses selecting an image which has been halftoned (column 4, lines 60-66 of Rao). The image I (figure 2(202) of Rao) which is to be halftoned (column 4, lines 60-66 of Rao) must be selected in order to be input.

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Rao further discloses determining the number of tone levels ( $2^B$ ) required for each pixel of the halftoned image (column 5, lines 56-59 of Rao); identifying a halftone cell size (column 5, lines 45-50 and column 6, lines 17-19 of Rao); and arranging a dot growth pattern and growing a dot pattern in a second generation halftone of the selected image (column 6, lines 43-49 of Rao). In order to halftone a grayscale image (column 6, lines 43-49 of Rao), it is inherent that some form of dot pattern must be arranged and grown in order to represent the grayscale image as halftone dots.

Rao does not disclose expressly arranging a dot growth pattern to offset initial dot growth from the center of the halftone cell by defining sub-cells and growing the dot pattern relative to the sub-cell; determining a sub-pixel level difference; and that growing the dot pattern includes growing the dot pattern evenly across the second generation image by setting the sub-pixel level difference to one.

Karlsson discloses arranging a dot growth pattern (figures 5-7 of Karlsson) to offset initial dot growth from the center of the halftone cell by defining sub-cells and growing the dot pattern relative to the sub-cell (column 5, lines 50-52; column 6, lines 35-38; and column 7, lines 10-14 of Karlsson). The halftoning stages are performed with sub-cells that have a plurality of possible grayscale values (column 5, lines 52-55 of Karlsson). The first stage of growth cycles through all the grayscale values for the left column (figure 5 and column 5, lines 50-52 of Karlsson), the second stage of growth cycles through all the grayscale values for the middle column (figure 6 and column 6, lines 35-38 of Karlsson), and the final stage of growth cycles through all the grayscale values for the right

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column (figure 7 and column 7, lines 10-14 of Karlsson). Since the left column begins the growth of the halftone sub-cells (figure 5 and column 5, lines 50-52 of Karlsson), then said dot growth pattern is initially offset from the center of the overall halftone cell.

Karlsson further discloses growing the dot pattern evenly across the image by setting the sub-pixel level difference to one (figure 5; column 6, lines 5-11; and column 8, lines 52-62 of Karlsson). Karlsson teaches that the supercell array (figure 5(500) of Karlsson) can be configured in any desired manner and the order of growth can occur in any desired progression of stages (column 8, lines 52-62 of Karlsson). In the example of figure 5 of Karlsson, the order of growth progresses such that, in the left column, each sub-pixel is increased by one grayscale value until all the sub-pixels in the left column are the same value (column 5, line 63 to column 6, line 4 of Karlsson). Then, after all the sub-pixels of the left column have attained the same color, the growth progression repeats, but with the next grayscale level (column 6, lines 5-11 of Karlsson). Therefore, the sub-pixel level difference has been set to one. Since figures 5-7 of Karlsson are merely exemplary and any configuration and pixel growth can be defined (column 8, lines 52-62 of Karlsson), it would be obvious to one of ordinary skill in the art to apply the growth pattern of the left column of the supercell to the entire supercell. In other words, the progression would occur such that every sub-pixel in the supercell is the same grayscale value before a sub-pixel is set to the next grayscale value.

Rao and Karlsson are combinable because they are from the same field of endeavor, namely halftone image processing. At

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the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the dot growth pattern taught by Karlsson to the second-generation halftone method taught by Rao. The motivation for doing so would have been to reduce image artifacts (column 3, lines 12-16 of Karlsson). Therefore, it would have been obvious to combine Karlsson with Rao to obtain the invention as specified in claims 1-3 and 8.

**Further regarding claims 4 and 11:** Karlsson discloses that said defining a sub-cell includes defining a cell to be a 4x4 pixel matrix (figure 10 and column 8, lines 35-38 of Karlsson). Karlsson further teaches defining a supercell (figure 9 of Karlsson) comprising four separate sub-cells as a 2D matrix (column 8, lines 25-32 of Karlsson), having a sub-pixel level difference matrix value for each pixel in the cell and sub-cell (column 8, lines 28-34 of Karlsson). Distributing the elements in the classes (column 8, lines 28-34 of Karlsson) determines how the dot pattern is grown (column 5, lines 10-17 of Karlsson). Splitting the supercell into four sub-cells (figure 9 and column 8, lines 25-29 of Karlsson) will result in four sub-cells of 2x2 pixels if performed on the supercell in the example of figure 10 of Karlsson). Further, since the supercell can be configured in any desired manner (column 8, lines 60-62 of Karlsson), the order of each of the sub-cells of figure 10 of Karlsson can be modified such that each 2x2 pixel sub-cell contains  $0_x$ ,  $1_x$ ,  $2_x$  and  $3_x$ , where 'x' is the integer denoting the order for the particular pixel.

**Regarding claims 5 and 12:** Rao discloses that said arranging includes scaling up the matrix values from zero to one, to zero to 255 (column 5, lines 56-59 and column 2, lines

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37-38 of Rao). If the number of bits (B) is chosen (column 5, lines 56-59 of Rao) to be 8 (column 2, lines 37-38 of Rao), then the matrix values are scaled up from zero to one (1-bit halftone) to zero to 255 ( $2^8=256$ ).

**Regarding claims 6 and 9:** Rao discloses that the number of tone levels is fifteen levels of gray plus white (column 5, lines 56-59 and column 2, lines 37-38 of Rao). If the number of bits (B) is chosen (column 5, lines 56-59 of Rao) to be 4 (column 2, lines 37-38 of Rao), then the number of tone levels is fifteen levels of gray plus white ( $2^4=16$ ).

**Further regarding claims 7 and 10:** Karlsson discloses that the cell size is 4x4 pixels (figure 1 and column 4, lines 28-34 of Karlsson).

### **Conclusion**

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wang et al., US Patent 5,740,279, 14 April 1998.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A Thompson whose telephone number is 703-305-6329. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703-308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson  
Examiner  
Art Unit 2624

JAT  
25 October 2004



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